U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-256 345

Extramural Research Sponsored by the Grosse Ile Laboratory

National Environmental Research Center

November 1974

BIBLIOGRAPHIC DATA SHEET	1. Report No.	2.	3. Recipient's Accession No. PB-256 345
4. Title and Subtitle Extramural Research Sponsored by the Grosse Ile Laboratory.			5. Report Date November 1974 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address National Environmental Research Center Corvallis, Oregon			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Address			13. Type of Report & Period Covered 14.

15. Supplementary Notes

See also PB-256 346.

16. Abstracts

The report contains summaries of research projects concerning water quality in the Great Lakes.

17. Key Words and Document Analysis. 17a. Descriptors

*Water pollution abatement
*Great Lakes
Research
Lake Erie
Lake Ontario
Lake Huron
International relations

17b. Identifiers/Open-Ended Terms

17c. COSATI Field Group 13B, 8H

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
National Technical Information Service Springfield, VA 22161	UNCLASSIFIED	26
	20. Security Class (This Page) UNCLASSIFIED	22. Price PC$4.00/ MF$2.25

FORM NTIS-35 (REV. 10-73) ENDORSED BY ANSI AND UNESCO. THIS FORM MAY BE REPRODUCED USCOMM-DC 8265-P74

EPA 002304

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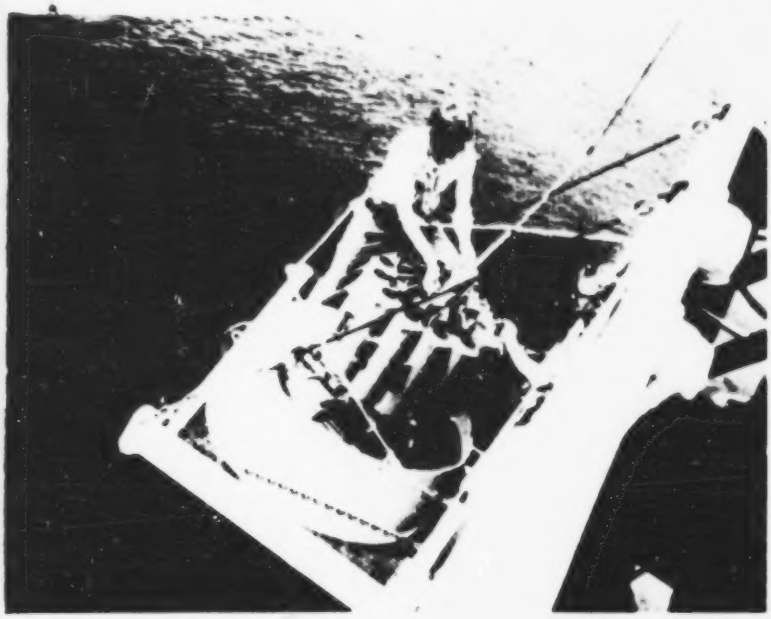
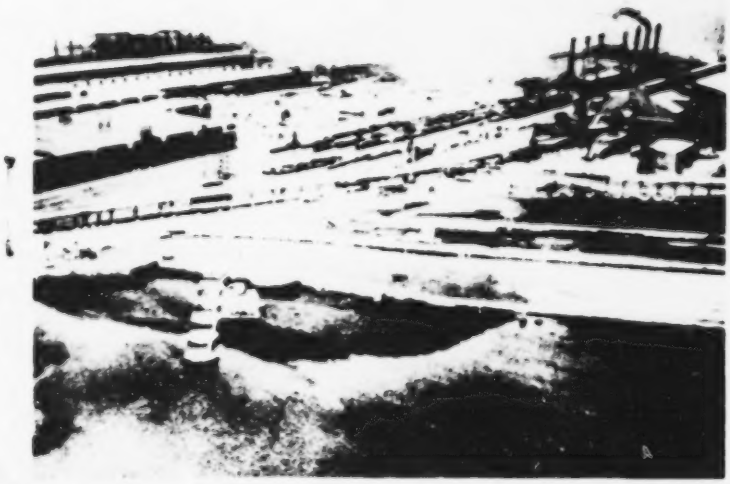
PB 256 345

GROSSE ILE LABORATORY
U.S. ENVIRONMENTAL PROTECTION AGENCY
QUARTERLY REPORT





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EXTRAMURAL RESEARCH

SPONSORED BY

THE GROSSE ILE LABORATORY

Environmental Protection Agency
The National Environmental Research Center - Corvallis
Office of Research and Development

November 1974

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R005

NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA
R800610 - 03

MATHEMATICAL MODELLING OF EUTROPHICATION OF LARGE LAKES

PRINCIPAL INVESTIGATORS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Robert Thomann, Associate Professor

NAME AND ADDRESS OF APPLICANT INSTITUTION

Manhattan College
Civil Engineering Dept.
Bronx, New York 10471

SUMMARY OF PROPOSED WORK - (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 4/1/72 - 3/31/75	Budget Period 4/1/74 - 3/31/75
Total Project Cost $242,100.00	Grant Program Large Lakes Research
EPA Project Officer William L. Richardson	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The objective of this proposed research is to structure and implement numerical models of phytoplankton biomass for the purpose of managing eutrophication in the Great Lakes. Development of eutrophication models for Lake Huron, Lake Erie and their interaction with Lake Ontario is a necessity if Great Lakes water quality is to be managed properly, and the terms of the International Agreement with Canada are carried out. It is logical that this work be an extension of the work initiated on Lake Ontario by the Manhattan College group for IFYGL as much time and money will be saved by avoiding preparation of new software if another group were to be retained. Documentation of software (models) is an explicit part of the research results which will allow future utilization by EPA regional or research groups or by planning and policy agencies as the Great Lakes Basin Commission and International Joint Commission. This research would be done in close cooperation and interaction with proposed experimental research on biochemical mechanisms and surveys of water quality.

First Year - Model formulation and testing and data compilation for Lake Huron with documentation of currently available computer programs. Formulation of simplified lake water quality models.

Second Year - Incorporation of kinetic experimental results and continuation of model development for Lake Huron with verification by year end.

Third Year - Complete simulations of control alternatives for Lake Huron and and document new computer programs. For Lake Erie, verify central basin model and simulate control alternatives. Simplified models will be documented and tested for the case of lakes-in-series for effects of possible long term interactions.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
SIE
EPA
S-800772

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT

TREATMENT OF COKE PLANT WASTE LIQUOR

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Richard Joblin, Director, Engineering and Environmental Control

William F. Kemner, Manager, Environmental Control

NAME AND ADDRESS OF APPLICANT INSTITUTION

Alan Wood Steel Company
Conshohocken, Pennsylvania 19428

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with governments and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period	Budget Period
12/15/71 - 9/15/74	12/15/71 - 9/15/74
Total Project Cost	Grant Program
$2,010,100.00	Heavy Industrial Sources
EPA Project Officer Dr. Hugh B. Durham, Chief, Heavy Industrial Sources Branch	Address EPA, Grosse Ile Laboratory, 9311 Groh Road, Grosse Ile, Michigan 48138

The objective of the project is to demonstrate the technical and economic feasibility of a chemical, thermal, physical waste treatment process to treat the coke plant waste liquor stream.

The coke plant waste liquor stream from the Alan Wood Steel Company's Conshohocken, Pennsylvania plant contains a variety of waste contaminants including suspended solids, dissolved organics, cyanide, ammonia, phenols, etc. The treatment processes to be employed to remove the waste contaminants and prepare the 125 gpm of waste water to meet stream objectives will include stripping of ammonia, concentration by six effect multistage evaporator, stripping of phenols, biological treatment of phenols, disposal by incineration. The product water is to be reused in a closed cooling tower system to alleviate thermal pollution from cooling waters in the coke plant.

Laboratory evaluations and pilot plant tests will be conducted to obtain basic design parameters for the entire treatment sequence. A treatment system will be constructed to treat 180,000 gallons/day of waste water. Post-construction studies will be conducted to verify the treatment plant design parameters and to establish an accurate estimate of the economics involved with the treatment process and the treatment effectiveness.

2<

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

SIE

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA
R800965 02

TITLE OF PROJECT

USE OF NUTRIENT BIOASSAY PROCEDURES IN THE GREAT LAKES

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Claire Schelske
Limnologist

NAME AND ADDRESS OF APPLICANT INSTITUTION

University of Michigan
3014 Administration Bldg.
Ann Arbor, Michigan 48104

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 5/1/73 - 4/30/75	Budget Period 5/1/74 - 4/30/75
Total Project Cost $193,824.00	Grant Program Great Lakes Research
EPA Project Officer Nelson A. Thomas	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

We propose to continue a series of experiments on the effect of nutrients in the growth of natural phytoplankton and SELENASTRUM in waters from Lake Huron, Lake Michigan and Lake Erie. Specifically, these experiments provide data that can be used to estimate the effects of phosphorus, nitrogen, silica and other factors on standing crops of algae. Results of each of the three types of experiments will be compared between lake and seasons and for spatial differences within lakes.

Three types of experiments, two spike tests and one fixed-level test, will be conducted. The spike tests will be run with (1) SELENASTRUM Capricornutum Printz, using the algal assay procedure, and (2) natural phytoplankton assemblages as the test organisms. The fixed-level test (nutrients maintained at a specified level throughout the experiment) will be run with natural phytoplankton assemblages.

A statistical design which includes replicates of all possible combinations of nutrients will be used. Effects of nutrient additions will be evaluated from measurements of chlorophyll a, cell counts, and production of organic carbon. As the project continues, we hope to be able to determine which parameter best measures responses and thus to simplify the experimental design. Statistical models will be developed, based on data from the experiments, to describe the output and for use in determining benefits of nutrient removal programs.

The project objectives are to provide (a) a study of several nutrient bioassay proceedures with water from Lakes Huron, Erie, and Michigan; (b) data to show the effect of different levels of major nutrients on the phytoplankton standing crop; (c) results that will show which nutrients, if any, are limiting; (d) a comparison of the algal assay procedure with experiments on natural phytoplankton populations; and (e) an analysis of the applicability of these results to nutrient removal programs and management needs relating to controlling eutrophication of the Great Lakes.

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PROJECT NO. (Do not use this space)

SSIE

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EPA R801112 - 03

TITLE OF PROJECT

WATER QUALITY IMPACTS OF SEDIMENT DREDGING IN LARGE LAKES SYSTEMS

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Walter J. Weber, Jr., Professor of Environmental & WRE

Judd C. Posner, Research Associate of Environmental & WRE

NAME AND ADDRESS OF APPLICANT INSTITUTION

University of Michigan
3014 Administration Building
Ann Arbor, Michigan 48104

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Yes summary is to be used for these purposes.

Project Period 9/6/72 - 9/5/75	Budget Period 9/6/73 - 9/5/74
Total Project Cost $275,000.00	Grant Program Great Lakes Research
EPA Project Officer Dr. Michael D. Mullin	Address EPA, Grosse Ile Laboratory 9311 Groh R., Grosse Ile, Mich.

1. Objectives- This study is designed to elucidate the rates and mechanisms of the exchange of chemical species between sediments and water during the disposal of dredged spoil in open lake areas.

2. Approach - Lab studies will invilve the intermixing of sediments obtained from areas of current and future dredging activity with lake water from proposed or actual dumping sites. The rates of release of organic and inorganic species will be measured. Later, testing will be used to test lab findings.

3. Current Plans and Progress - Seven sites have been chosen for sampling and have been or will be sampled before the beginning of dredging activity in 1973. Lab work up to the present has dealt mainly with the establishment of experimental and analytical procedures to be followed.

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OMB No. 158-R0037

NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

S801989

TITLE OF PROJECT: DEMONSTRATION AND EVALUATION OF COUNTERCURRENT RINSING FOR REDUCING POLLUTION FROM A HALOGEN TINPLATING LINE

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. D. A. Pengidore, Assistant Chief Engineer-Projects (Project Director)
Mr. G. P. Current, Industrial Health Engineer
Mr. A. J. Lamantia, Head Technician-Tin Mill
Mr. L. W. Austin, Research Associate

NAME AND ADDRESS OF APPLICANT INSTITUTION

Weirton Steel Division
Division of National Steel Corp.
Weirton, West Virginia 26062

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 3/1/73 - 2/28/75	Budget Period 3/1/73 - 2/28/75
Total Project Cost $318,454.00	Grant Program Heavy Industrial Sources
EPA Project Officer Mr. George F. Weesner, EPT - R&D	Address Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The primary objective of this project is to upgrade the state of the art of pollution control of a halogen tinplating line dragout rinse. Hopefully, this project will result in a process which will have a zero discharge from the halogen dragout rinse.

The project involves the use of countercurrent rinsing on the primary dragout rinse tank of a high speed Halogen tinplating line. In the current operation the strip is submersed in a tank of water and the strip moves countercurrent to the movement of water. The resulting discharge is large in volume and low in concentration of plating solution. The proposed system is a multi-stage counter-current rinse tank. The strip is not submersed but travels over the tanks. Fresh water is fed into the exit end of the tank. As the strip passes from stage to stage it sees a less concentrated rinse water. The resulting discharge will than be reused as makeup in the plating cells. The project objectives include:

(1) To demonstrate on a full-scale production line that countercurrent rinsing in the primary dragout tank with subsequent reuse of the blowdown as makeup in the plating is applicable through the use of AA-40 additive to minimize sludge buildup.
(2) Complete recycle of discharge to realize a zero discharge or to minimize discharge.

5<

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NOTICE OF RESEARCH PROJECT

PROJECT No. (Do not use this space)
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PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA
S-802142

TITLE OF PROJECT

REGENERATION OF HYDROCHLORIC ACID WASTE PICKLE LIQUOR

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. Lars Hansen

Mr. Jack Wade, Project Director

NAME AND ADDRESS OF APPLICANT INSTITUTION

Toledo Pickling & Steel Service, Inc.
1149 Campbell Street
Toledo, Ohio 43607

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period	Budget Period
3/1/73 - 2/28/75	3/1/73 - 2/28/75
Total Project Cost	**Grant Program**
$383,161.00	Heavy Industrial Sources
EPA Project Officer	**Address**
Mr. George F. Weesner, EPT - R&D	EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The principal objective of this project is to demonstrate in a plant scale continuous operation the technical and economic feasibility of using the Environmental Technology, Inc., process and equipment for the recovery and regeneration of waste hydrochloric acid pickle liquor in a closed-loop system in which no noxious pollutants escape into the environment.

The process employs thermal degradation of ferrous chloride to hydrogen chloride gas and ferric oxide. The waste pickle liquor consisting primarily of aqueous ferrous chloride, with some unreacted hydrochloric acid, is sprayed onto a vibrating fixed bed of ferric oxide, in an oxidizing atmosphere. The process is expected to yield 18-20% hydrochloric acid for recycling and ferric oxide of any desired particle size.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

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PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA
802359 02

TITLE OF PROJECT

NEAR SHORE DIFFUSION STUDIES

GIVE NAME, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Wilbert Lick
Professor of Geophysics and Engineering

NAME AND ADDRESS OF APPLICANT INSTITUTION

Case Western Reserve University
2040 Adelbert Road
Cleveland, Ohio 44106

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 5/1/73 - 4/30/75	Budget Period 5/1/74 - 4/30/75
Total Project Cost $185,579.00	Grant Program Great Lakes Research
EPA Project Officer William L. Richardson	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The proposed research will involve numerical, observational and experimental studies of the near-shore areas of the Great Lakes, specifically on Lake Erie in the Cleveland Harbor area. The output will be in the form of a general mathematical model of pollutant transport and effect to be used as an enforcement and management tool. Specifically, a) existing hydrodynamic models will be extended so as to be capable of describing in detail the hydrodynamics of near-shore areas, b) general research and description of diffusion of conservative substances will be undertaken and c) diffusion model results will be compared to experimental results.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
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EPA
R802464 02

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT
NUTRITION OF GREAT LAKES CLADOPHORA

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Gerald C. Gerloff, Professor and Senior Scientist

G. P. Fitzgerald, Professor and Senior Scientist

NAME AND ADDRESS OF APPLICANT INSTITUTION
University of Wisconsin
Madison, Wisconsin 53706

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 6/15/73 - 6/14/75	Budget Period 6/15/74 - 6/14/75
Total Project Cost $154,202.00	Grant Program Great Lakes Research
EPA Project Officer Nelson A. Thomas	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The study of Cladophora has been inhibited because of the extreme difficulty in culturing this alga under laboratory conditions. It is essential that we know the nutritional requirements of this nuisance plant if we are to have a sensible phosphorus removal program. Dr. Fitzgerald and Dr. Gerloff are experienced in the growth of variour aquatic plants and have done extensive work with Cladophora.

8<

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

R802433 - 02

Dr. Charles O. Hartwedorf, Director
Center for Lake Erie Area Research

The Ohio State University, College of Biological Sciences
484 West 12th Avenue
Columbus, Ohio 43210

Project Period 6/19/72 - 6/17/76	Budget Period 6/18/74 - 3/31/75
Total Project Cost $320,014.00	Grant Program Great Lakes Research
EPA Project Officer Michael D. Mullin	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The proposed research will determine the effectiveness of Federal, state and local nutrient control programs on Lake Erie in reducing the over-enrichment of this important body of water. The prime objectives of this research will be the development of a system of indicators which will index the state of eutrophication in the lake as a function of time. This objective will be approached through a series of repetitive field surveys in the western and central basins of Lake Erie to monitor various trophic levels in the ecosystem of the lake and to analyze physico-chemical properties of the water and the sediment.

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NOTICE OF RESEARCH PROJECT

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Form Approved
OMB No. 158-R0012

Project No. (To be supplied by EPA)

EPA
802685

TITLE OF PROJECT

UPPER LAKES REFERENCE STUDY

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

V. Elliott Smith, Ph. D.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Cranbrook Institute of Science
Lake Research Program
500 Lone Pine Road, Bloomfield Hills, Mich. 48013

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data).
In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 7/1/73 - 12/30/75	Budget Period 7/1/73 - 6/30/74
Total Project Cost $268,632.00	Grant Program Great Lakes Research
EPA Project Officer William L. Richardson	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

A detailed survey of chemical and biological factors of water quality in Saginaw Bay, Michigan (Western Lake Huron) will be undertaken as part of the Upper Lakes Reference Study. The goals of the parent study are to characterize the hydrological processes that occur in the bay, to develop a model of waste loadings and to predict the effects of reduced loadings. Goals of the present survey are to gather past and current data on water quality variables, environmental factors and bay morphology. Statistical analysis of the combined data will be used in developing a model of cause and effect relationships.

Variables to be monitored in this survey will include: dissolved oxygen, pH, conductivity, water color and transparency, chlorophyll, organic carbon, nitrogen and phosphorus, nitrate-nitrite, orthophosphate, ammonia, sulfate, silica and metallic ions. Sampling sites will cover the bay and adjacent waters of Lake Huron, and will include stations used in previous surveys. Routine monitoring and special field studies will take place over a 19-month period.

The resulting model will be useful in formulating policies for pollution abatement in Saginaw Bay and similar water bodies.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
SSIE
EPA
802706 - 02

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT
LAKE ERIE NUTRIENT CONTROL PROGRAM

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Robert Sweeney, Director
Great Lakes Lab.

NAME AND ADDRESS OF APPLICANT INSTITUTION

State University of New York at Buffalo
P.O. Box 7126
Albany, New York 12224

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 6/1/73 - 5/31/76	Budget Period 7/1/74 - 6/31/75
Total Project Cost $294,187.00	Grant Program Great Lakes Research
EPA Project Officer Michael D. Mullin	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

Objectives: a) Collect and analyze water and sediment samples as well as phytoplankton, zooplankton and benthos in order to ascertain the eutrophic status and to establish an ecological baseline for the Eastern Basin.

b) Evaluate the nature and extent of problems associated with over-enrichment as well as the effectiveness of pollution abatement programs on a large lake.

Approach: a) Twenty-five (25) stations in the Eastern Basin of Lake Erie will be visited during each of 15 cruises between 1 July 1974 and 30 June, 1975.

b) Chemical and biological analyses will be made according to the procedures used in the IFYGL program.

c) A model for oxygen depletion in the hypolimnion will be constructed using the procedures developed by Burns of the Canada Centre for Inland Waters.

Progress: a) Twenty-five (25) stations in the Eastern Basin were visited on twelve (12) occasions during 1973. Progress Report available upon request fron the Principle Investigator.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
SSIE
EPA
802780 - 01

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT BIOLOGICAL RESPONSES TO EUTROPHICATION IN SAGINAW BAY AREA AND LAKE HURON

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Eugene Stoermer
Research Algologist

NAME AND ADDRESS OF APPLICANT INSTITUTION

University of Michigan
3014 Administration Building
Ann Arbor, Michigan 48104

SUMMARY OF PROPOSED WORK - (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 12/1/73 - 12/31/75	Budget Period 12/1/73 - 11/30/74
Total Project Cost $263,158.00	Grant Program Great Lakes Research
EPA Project Officer Nelson A. Thomas	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

This project is part of a coordinated program designed to assess the effects of eutrophication on biological processes in Saginaw Bay and the impact of conditions and processes in the bay on water quality in Lake Huron.

Proposed work includes:

1. An initial assessment of eutrophication patterns as reflected in relatively conservative elements of the system such as the benthic invertebrate fauna.

2. Synoptic cruises to measure gross patterns of change in phytoplankton and zooplankton distribution and abundance in Saginaw Bay and adjacent waters of Lake Huron. Complimentary chemical measurements will be taken under another project.

3. These results will be used to plan an intensive field observation program. Measurements included in this program are: 1) Abundance and species composition of phytoplankton. 2) Estimates of standing crop of phytoplankton (Chlorophyll a, TOC, cell counts). 3) Estimates of phytoplankton process rates (14C fixation, N fixation). 4) Species composition and abundance of zooplankton. 5) Estimates of zooplankton standing stock. 6) Estimates of process rates of zooplankton. These measurements will be fully coordinated with chemical measurement program carried out under another project.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

SSIE

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA R803030 - 01

TITLE OF PROJECT

MATHEMATICAL MODELS OF WATER QUALITY IN LARGE LAKES

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Dominic DiToro
Adjunct Associate Professor

NAME AND ADDRESS OF APPLICANT INSTITUTION

Manhattan College
Civil Engineering Dept.
Bronx, New York 10471

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 2/1/74 - 1/31/77	Budget Period 2/1/74 - 1131/75
Total Project Cost $364,848.00	Grant Program Great Lakes Research
EPA Project Officer William L. Richardson	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The objective of this proposed research is to structure and implement numerical models of phytoplankton biomass for the purpose of managing eutrophication in the Great Lakes. Development of eutrophication models for Lake Huron, Lake Erie and their interaction with Lake Ontario is a necessity if Great Lakes water quality is to be managed properly, and the terms of the International Agreement with Canada are carried out. It is logical that this work be an extension of the work initiated on Lake Ontario by the Manhattan College group for IFYFL as much time and money will be saved by avoiding preparation of new software if another group were to be retained. Documentation of software (models) is an explicit part of the research results which will allow future utilization by EPA regional or research groups or by planning and policy agencies as the Great Lakes Basin Commission and International Joint Commission. This research would be done in close cooperation and interaction with proposed experimental research on biochemical mechanisms and surveys of water quality.

First Year - Model formulation and testing and data compilation for Lake Huron with documentation of currently available computer programs. Formulation of simplified lake water quality models.

Second Year - Incorporation of kinetic experimental results and continuation of model development for Lake Huron with verification by year end.

Third Year - Complete simulations of control alternatives for Lake Huron and document new computer programs. For Lake Erie, verify central basin model and simulate control alternatives. Simplified models will be documented and tested for the case of lakes-in-series for effects of possible long term interactions.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. [illegible]

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

R-803037 - 01

TITLE OF PROJECT

CHARACTERISTICS OF BENTHIC ALGAL COMMUNITIES IN THE UPPER GREAT LAKES

GIVE NAME(S), ORGANIZATION(S), AND OFFICIAL TITLE(S) OF PRINCIPAL INVESTIGATOR(S)/PROJECT DIRECTOR(S) AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED ON THE PROJECT.

Dr. Eugene Stoermer
Research Algologist

NAME AND ADDRESS OF APPLICANT INSTITUTION

University of Michigan
3014 Administration Building
Ann Arbor, Michigan 48104

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit proprietary information.) In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private organizations supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period	Budget Period
6/1/74 - 5/31/77	6/1/74 - 5/31/75
Total Project Cost	Grant Program
$100,879.00	Great Lakes Research
EPA Project Officer	Address
Nelson A. Thomas	EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The objectives of the proposed research are (1) to provide an objective comparison of the benthic algal communities occurring on particular substrate types in the Upper Great Lakes. This information should serve both to point out areas that are presently being adversely affected by accelerated eutrophication and to provide baseline information against which possible future changes may be judged, and (2) an effort will also be made to reconstruct, insofar as is possible, the original status of such communities be recovery and analysis of historic collections from the region. Knowledge of the changes that have occurred in the benthic algal communities could provide insight into the slow and minute changes that have occurred in the Great Lakes.

The general approach of the proposed research involves the recovery of historic collections and collection of new data on previously unanalyzed sample sites. If recent collections are not available from the more important historical sites, collections will also be repeated.

The staff at the University of Michigan is amply qualified to perform the taxonomy on the benthic communities. Their laboratory contains a more than adequate array of microscopes and instruments to describe the changes that have occurred over the past 100 years.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
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EPA
5803064
12070HEK

TITLE OF PROJECT

REGENERATION OF CHROMATED ALUMINUM DEOXIDIZER SOLUTIONS

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. Allan T. Taylor, Technology Manager
Mr. Robert a. Jarmuth, Group Supervisor
Mr. Harry C. Hicks, Principal Investigator

NAME AND ADDRESS OF APPLICANT INSTITUTION

The Boeing Commercial Airplane Co.
P.O. Box 3707
Seattle, Washington 98124

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 8/1/71 - 10/31/73	Budget Period 8/1/71 - 10/31/73
Total Project Cost $58,820.00	Grant Program Heavy Industrial
EPA Project Officer Dr. Hugh B. Durham Chief, Heavy Industrial Branch	Address EPA, Grosse Ile Laboratory 9311 Groh Rd. Grosse Ile, Michigan 48138

Chromium compounds have long been recognized by the metal finishing industry as major contributors to pollution. Large quantities, estimated at several hundreds of tons, are disposed of annually through discard of spent aluminum deoxidizer solutions.

Preliminary research work has proven that it is feasible to regenerate spent deoxidizer solutions in preference to discarding them. Thus, it is possible, by applying chemical engineering technology, to maintain the acceptable performance of these chromium-containing solutions indefinitely. By making this technology available to all metal finishers, a significant contribution to anti-pollution efforts can be made. Early figures indicate that regeneration costs will be considerably less than disposal costs.

The proposed technique involves electrolytic regeneration of the active compounds plus removal of the undesirable materials by precipitation and separation.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
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PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA continuation of 12070HEK
S803064

TITLE OF PROJECT REGENERATION OF CHROMATED ALUMINUM DEOXIDIZERS: PHASE II-IMPROVED DIAPHRAGMS

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. Allan T. Taylor, Technology Manager
Mr. R. G. Christner, Supervisor
Mr. Donald F. Sekits, Research Engineer
Mr. Harry C. Hicks, Research Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

The Boeing Commercial Airplane Co.
O.O. Box 3707
Seattle, Washington 98124

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 8/1/71 - 10/31/74	Budget Period 8/1/71 - 10/31/74
Total Project Cost $89,853.00	Grant Program Heavy Industrial
EPA Project Officer Dr. Hugh Durham, Chief, Heavy Industrial Branch	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

In the regeneration process for chromated aluminum deoxidizers as conducted in the original work of Project 12070HEK, it is necessary to use a chemically inert, electrically conductive diaphragm separating positive and negative electrodes. Such a diaphragm was developed during the program and a patent disclosure was made.

The fabrication method for these early diaphragms is costly and life expectancy is short. This continuation contract proposes to improve cost and performance of the diaphragms in order to make them commercially attractive for general job shop use.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
SSIE
EPA
S803073

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT

AIRCRAFT FACTORY WASTE WATER RECYCLING-PILOT SCALE DEMONSTRATION

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. Allan T. Taylor
Mr. Richard G. Christner
Mr. Donald F. Sikits
Mr. Alan K. Robinson (Principal Investigator)
Mr. Eugene Sutliff
Mr. Donald A. Anglin
Mr. Roy K. Olson

NAME AND ADDRESS OF APPLICANT INSTITUTION

The Boeing Commercial Airplane Co.
P.O. Box 3707
Seattle, Washington 98124

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 7/31/74 - 7/30/76	Budget Period 7/31/74 - 7/30/76
Total Project Cost $206,106.00	Grant Program Heavy Industrial
EPA Project Officer Dr. Hugh Durham, Chief, Heavy Indust.	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The objective of this project is a pilot scale demonstration of treatment and recycle of four dilute wastewater streams resulting from aircraft manufacture. The streams involved are: 1) Chemical process rinses, for which both in-exchange and reverse osmosis are to be tried 2) Dye penetrant rinse water, to be treated by activated carbon adsorption 3) Cyanide-containing rinses, to be treated by electrolytic destruction, and 4) Cutting oil emulsion waste, for which ultrafiltration is to be demonstrated.

After installation, there will be a six-month optimization period, at the end of which a decision will be made between in-exchange and reverse osmosis for treatment of chemical process rinses. There will than be a 9 month period of continuous operation to demonstrate operation under actual plant conditions, and to determine if there would be any buildup of undesirable contaminants. Both recurring and non-recurring costs of a full-scale recycling plant will be determined.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
SSIE
EPA
R803086 - 01

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT

PLANKTON & NUTRIENT RELATIONSHIPS IN SOUTHERN LAKE HURON

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Claire L. Schelske
Research Limnologist

NAME AND ADDRESS OF APPLICANT INSTITUTION

University of Michigan
3014 Administration Bldg.
Ann Arbor, Michigan 48104

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 4/1/74 - 3/31/76	Budget Period 4/1/74 - 3/31/75
Total Project Cost $526,315.00	Grant Program Great Lakes Research
EPA Project Officer Nelson A. Thomas	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

We propose to continue a series of experiments on the effect of nutrients in the growth of natural phytoplankton and SELANASTRUM in waters from Lake Huron, Lake Michigan and Lake Erie. Specifically, these experiments provide data that can be used to estimate the effects of phosphorus, nitrogen, silica and other factors on standing crops of algae. Results of each of the three types of experiments will be compared between lakes and seasons and for spatial differences within lakes.

Three types of experiments, two spike tests and one fixed-level test, will be conducted. The spike tests will be run with (1) SELENASTRUM CAPRICORNUTUM, using the algal assay procedure, and (2) natural phytoplankton assemblages as the test organisms. The fixed-level test (nutrients maintained at a specified level throughout the experiment) will be run with natural phytoplankton assemblages.

A statistical design which includes replicates of all possible combinations of nutrients will be used. Effects of nutrient additions will be evaluated from measurements of chlorophyll a, cell counts, and production of organic carbon. As the project continues, we hope to be able to determine which parameter best measures responses and thus to simplify the experimental design. Statistical models will be developed, based on the data from the experiments, to describe the output and for use in determining benefits of nutrient removal programs.

The project objectives are to provide (a) a study of several nutrient bioassay procedures with water from Lakes Huron, Erie, and Michigan; (b) data to show the effect of different levels of major nutrients on the phytoplankton standing crop; (c) results that will show which nutrients, if any, are limiting; (d) a comparison of the algal assay procedure with experiments on natural phytoplankton populations; and (e) an analysis of the applicability of these results to nutrient removal programs and management needs relating to controlling eutrophication of the Great Lakes.

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OMB No. 158-R0082

NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

SSIE

EPA
803120

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT TITLE

THE SOURCES OF PHOSPHORUS OF THE PERIDINIUM BLOOM IN LAKE KINNERET

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Colette Serruya, Director
Kinneret Limnological Laboratory

NAME AND ADDRESS OF APPLICANT INSTITUTION

Kinneret Limnological Laboratory
P.O. Box 345
Tiberias, Israel

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 7/1/74 - 6/30/77	Budget Period 7/1/74 - 6/30/75
Total Project Cost $ 163,117.00	Grant Program Great Lakes Research
EPA Project Officer Dr. Tudor T. Davies	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The objective of the proposed research is to add components to the existing data bank relating to the physics, chemistry and plankton biology of Lake Kinneret. The proposed additions are essential in order to use the existing data bank for verifying eutrophication models.

The approach is to investigate the two probable sources of phosphorus of the PERIDINIUM. This investigation is divided into laboratory experiments and field observations and measurements.

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

R803178 - 01

TITLE OF PROJECT

ZOOPLANKTON AND WATER QUALITY IN SOUTHERN LAKE HURON

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Donald C. McNaught
Associate Professor

NAME AND ADDRESS OF APPLICANT INSTITUTION

State University of New York
Dept. of Biological Sciences
Albany, New York 12222

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 5/16/74 - 5/15/76	Budget Period 5/16/74 - 5/15/75
Total Project Cost $143,449.00	Grant Program Great Lakes Research
EPA Project Officer Nelson A. Thomas	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The assessment of the distribution and production of zooplankton in southern Lake Huron with regard to sources of pollution, as well as the determination of the capability of zooplankton to graze pollution-indicating phytoplankton, constitute the principal objectives of this project. Our approach to the first problem will be two-fold: firstly, to sample the zooplankton with both nets and acoustically, and secondly, to process such field data using proven actuarial indices, including birth and death rates, in order to relate production of zooplankton to water quality. Our approach to the second problem, that concerning the feeding by zooplankton upon nuisance algae, will involve the use of tagged (14C) foods and scintillation counting techniques to discover what zooplankton eat in pristine and polluted waters. Their ability to graze blue-green algae will be related to the dominance of such forms in perturbed areas of Lake Huron. Our research team has experience on large lakes, having applied methods of ssessing secondary production during a study of Lake Ontario (IFYGL).

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)
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PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA
S803181 - 01

TITLE OF PROJECT

DEMONSTRATION OF EROSION AND SEDIMENT CONTROL TECHNOLOGY

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Alvin L. Franks
Engineering Geologist

NAME AND ADDRESS OF APPLICANT INSTITUTION

California State Water Resources Control Board
1416 Ninth Street
Sacramento, California 95814

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 8/1/74 - 7/30/77	Budget Period 8/1/74 - 7/30/77
Total Project Cost $230,000.00	Grant Program Hydrological Modification
EPA Project Officer Dr. Tudor T. Davies	Address EPA, Grosse Ile Laboratory 9311 Groh Road, Grosse Ile, MI.

The proposed demonstration will be carried out on the Northstar development in the Martis Valley watershed on 2,560 acres of timberland located immediately outside the Lake Tahoe Basin. The development includes condominiums, golf and ski facilities, and a commercial center. The objectives of the proposed demonstration are twofold. The first objective is the development of guidelines for erosion and sediment control planning and implementation for climatic, geologic, soils and development conditions within the Tahoe area. This will be accomplished by implementing some of the erosion control practices found to be effective in the prior demonstration studies and comparing these practices with those used by the developer. A complete evaluation will be made of cost, effectiveness and implementation procedures. The second objective will be evaluation and modification of the published EPA manual on Guidelines for Erosion and Sediment Control Planning and Implementation. This will be accomplished by documentation and analysis of the baseline data which has been collected since about 1968 along with additional data to be collected from the stations to be monitored during the demonstration.

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NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

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EPA

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

R-803187-01-0

TITLE OF PROJECT

"AN EVALUATION OF HAZARDOUS CHEMICALS IN THE GREAT LAKES"

GIVE NAME, DEPARTMENT, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

G. Fred Lee
Professor of Engineering and Applied Sciences

NAME AND ADDRESS OF APPLICANT INSTITUTION

University of Texas--Dallas
Dallas, Texas 75230

SUMMARY OF PROPOSED WORK - (1) Objectives, (2) Approach, (3) current Plans and/or Progress (200 words or less. Omit confidential data). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Project Period 07/01/74 - 06/30/77	Budget Period 07/01/74 - 06/30/75
Total Project Cost $135,262.00	Grant Program Research
EPA Project Officer Michael D. Mullin	Address EPA, Grosse Ile Laboratory 9311 Groh Road Grosse Ile, Michigan 48138

The overall objective is to establish a framework for developing a program for the control of hazardous chemicals in the Great Lakes. A State of the Art Report will be developed.

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